

Brazilian Soybean and Corn Panorama: Production and Price Study for the 2019/2020 Crop

João Pedro Morasco Agostinho¹, Edenis Cesar de Oliveira²

¹Federal University of Sao Carlos – UFSCar/CCN-LS – Brazil

²Federal University of Sao Carlos – UFSCar/CCN-LS – Brazil

Abstract:

This study aimed to identify the production variability and the market price of soybean and corn destined for export from the 2019/2020 crop in comparison with the period of the 2015/16 - 2018/19 crops. With a qualitative characteristic and a descriptive-exploratory objective, a bibliographic review was undertaken in scientific publications and information extracted from the official databases of the Ministry of Agriculture, Livestock and Supply (MAPA) and the National Supply Company (CONAB). The collected data were systematized with the help of Excel® tool, favoring the analysis and discussion of the main points assessed. There was an increase in the participation in national production, especially in the North and Northeast regions. The South region, the second largest grain producer in the country, faced serious climatic problems in the 2019/20 harvest, causing a reduction of around 10% in production. As for pricing, there was an increase in the prices of the 60kg bag of corn and soybeans internally, which reached double the price in the first quarter of 2020 compared to the same period of 2019. The closure of corn-based ethanol plants in the United States and the consequent change in the supply and price of the product in the international market may change the outlook for grains from the 2019/20 harvest on.

Key Word: *Brazilian agribusiness, agricultural production, commodities, agricultural harvest, international trade*

Date of Submission: 25-03-2021

Date of Acceptance: 09-04-2021

I. Introduction

Since the 1970s, with the creation of the Brazilian Agricultural Research Corporation (EMBRAPA), Brazil has intensified the generation of research and development in various aspects of the Brazilian rural environment and has been gradually increasing its productivity and competitiveness in the international market. Since then, it has consolidated itself as one of the main agro-exporters in the world, especially in the field of commodities. Barros and Castro (2017) point out that Brazilian agribusiness is able to withstand price volatility and grow even under unfavorable conditions, which characterizes the sector as one of the most resilient of the Brazilian economy, generating continuous wealth for the country, especially in the interior cities, where rural production and, consequently, jobs and income are concentrated more intensely. Such importance is reflected in the expressive participation of the agricultural sector in the national GDP, a percentage higher than other agro-exporting countries, such as the United States, China and India. The contribution occurs, above all, in two contexts: i) as a driver of the growth of the index, ii) in a critical and unstable economic scenario, as a supporter of the index (Oliveira & Carraro 2019) When analyzing specific problems in Brazilian agribusiness that had a major impact, such as the “Weak Meat” operation, carried out by the Federal Police, which affected the meat trade in significant volumes, but did not reduce the positive curve of agribusiness expansion, it is observed that the sector presents resistance, supported mainly by important public sector policies (Silva et al. 2020).

However, phenomena of international impact can interfere in the price of commodities and, consequently, affect the commercialization and supply of agri-food products, both in the domestic market and in the foreign market. Occurrences such as an uncontrolled increase in inventories, a strong imbalance in the supply and demand relationship, climatic and exchange rate variations, aspects of environmental and foreign trade regulation, in addition to the occurrence of epidemiological-sanitary issues (human and animal) are examples of this market's impact. According to Santos et al. (2016), in the international market for agricultural products, Brazil still has an export basket dependent on few products, as was observed in the 2009-2011 three-year period, when more than 50% of the export value came from only four products. As a consequence, more drastic levels of volatility in specific agricultural products can lead to financial losses for the country, represented by a potential imbalance in the trade balance, damage to rural properties and intensive job losses. In the case of soybeans and corn, its planted area in the country demonstrates the relevance it has for the Brazilian agribusiness sector. In the 2019/20 harvest, soy was responsible for 36 million hectares of planted area, whereas

corn reached more than 18 million hectares. For comparison purposes, the area destined for grain production in the country in the same period was 63 million hectares, that is, even considering products such as peanuts, rice, barley, beans and wheat, only corn and soybeans corresponded together to 84 % of the space allocated to grains. As these grains are mainly used for animal and human food, problems in their supply around the world can compromise food security, and become more expensive for the consumer. This research aimed to identify the variability of production and the market price of soybeans and corn destined for export as of the 2019/2020 crop compared to the 2015/16 - 2018/19 crop period. The text is structured as follows: in addition to this brief introduction, containing the objective of the research, section two presents the methodology used in the study. In section three, the literature review containing the basic framework necessary to theoretically support the research. Section four was reserved for presenting the main results, followed by the conclusion of the research conclusion (section 5).

II. Material and Methods

The research is characterized as exploratory-descriptive, supported by a bibliographic review with the intention of building a theoretical framework capable of sustaining the results obtained. The information was extracted from the official databases of the Ministry of Agriculture, Livestock and Supply (MAPA) and the National Supply Company (CONAB), with the most up-to-date data available until the end of this study. The collected data were systematized with the aid of the Excel® tool, favoring the analysis and discussion of the main points measured, in addition to the generation of Figures (graphs) for better data exposure.

III. Literature Review

3.1 Brazilian Agribusiness

From the beginning of the 1920s, there are records of works aimed at documenting, developing and applying theories to explain changes in the market structure and in the performance of the agri-food system. As explained by Waugh (1934), in the first work published on the increase in prices of products between harvests, and their discrepancies in the commercialization phase.

John David and Ray Goldberg (1957), the first authors to characterize “agribusiness”, formalized the concept as the sum total of the operations of production and distribution of agricultural supplies, of the operations of production in the agricultural units, of the storage, processing and distribution of products agricultural products and items produced from them. The authors introduced the idea that agribusiness involves the process of transforming and adding value to agricultural commodities, from the input industry to final consumers.

Brazilian agribusiness has been a mainstay of the economy. The main strengths considered by Cruvinel (2009) for the development of agribusiness in Brazil, are the availability of land and fresh water, favorable climate, human resources, management and capacity to generate production technology in the country, knowledge of tropical agriculture and sustainable development.

The context of national agribusiness is primarily a producer and exporter of commodities. According to Barros and Castro (2017), due to the strong protectionism and in view of the frequent trend of appreciation of the exchange rate in Brazil, the national agro-industry had difficulty in the last years to export products with higher added value.

To remain competitive, a high level of coordination between all the actors involved in the supply chain is necessary in order to produce differentiated agri-food products that meet consumer demands in order to ensure food safety and environmental sustainability.

Gasques and Vieira Filho (2016) argue that, in less than five decades, the country was a net importer for one of the largest food exporters in the world. Since 1970, with the expansion of the agricultural frontier, there have been two waves of growth in Brazilian agribusiness: the first, observed in the 1980s, with the tropicalization of several crops in the Cerrado biome; the second, with the development of improved seeds that integrate shorter production cycles, enabling the production of the safrinha in several regions.

Concomitantly, during the 1970s, structural changes in global financial markets and pressures for the consolidation of agribusiness institutions were instrumental in expanding credit and supporting rural communities (Ellinger et al. 2005).

Brazilian agriculture reveals productive potential both with cultivation in temperate zones and tropical zones. The South and Midwest regions of the country have a higher rainfall rate, better soils and more developed infrastructure in general. The properties in these regions use inputs intensively and are equipped with more advanced technologies (Maranhão & Filho 2017).

The strong growth of Brazilian agribusiness helped to boost the economy of the interior of the country (Serigati & Possamai 2016); consequently, the growth of interior cities was greater than that of metropolises in the first decade of this century. With this, the participation of the interior in the generation of income in the Brazilian economy increased (Mapa 2020).

Silva et al. (2020) argues that the concentration of shipping at the ports of Santos-SP, Vila Velha-ES and Itajaí-SC forces the accumulation of production in the surroundings, seeking to mitigate costs related to logistics, consequent losses in the road modal, in addition to raising the competitiveness of the national product.

A fact that Brazilian agribusiness is characterized by multifaceted specificities that bring constant challenges to the sector, either in increasing productivity to the detriment of the expansion of the planted area, or in compliance with legal regulations, in the insertion of technology in the most diverse stages of the processes, as well such as meeting the complex export regulations for products.

3.2 Agribusiness GDP

The Gross Domestic Product (GDP) of the sector corresponded to around 24% of the national GDP in 2020, a result greater than powers such as the United States and China (Mapa 2020). Barros (2016) points out that the participation of any sector in the economy depends, in addition to the volume of capital and work applied to it, on the evolution of productivity and relative prices between sectors. In the specific case of agribusiness, the relative importance depends on the evolution of two indicators: relative prices and volume growth.

Serigati and Possamai (2016), on the other hand, point to the fact of considering two economic aspects that involve the agricultural sector: the multiplier effect on the rest of the Brazilian economy and its impact on the labor market.

The evolution of sales in the agricultural market in the last decade is mainly due to the growth of emerging markets, especially India and China (Serigati & Possamai 2016). These economies strengthened the demand for food and other agricultural products, being decisive for establishing Brazil as an agro-exporter of global relevance, consolidating the participation of the agro sector in the national GDP. From 2000 to 2020, agriculture was the economic sector that grew most in the Brazilian economy, while, on average, services expanded 2.3% per year and industry 1.2%, agriculture increased 3.5% a.a. (Mapa 2020).

When compared, the agricultural GDP in the 1990s and in the last years, there is a jump from 40.8 billion in 1996 to 306.7 billion in 2016. More than 750% growth in 20 years (Mapa 2020). The evolution occurred due to profound changes, with emphasis on investments in technology, development and research, which led to increased productivity, in addition to the relative prices between the different sectors of the economy, and the external terms of trade (Barros 2016). Even in periods when problems with agricultural production occurred - as in the years 2012 and 2016 - when losses caused by pests, diseases or strong climatic variations occurred, the harvests continued, albeit in a smaller percentage, their significant contribution to the formation of the national GDP (Barros & Castro 2017).

3.3 Agro Exports

According to Maranhão and Filho (2017), for mostly agricultural countries like Brazil, the expansion of international trade in commodities, leveraged by the recent dynamism of trade among developing countries, has had a positive effect for economic growth, in addition to improving the national trade balance.

Brazil, one of the main agro-exporters in the world, leads in the export of sugar, coffee, orange juice, beef, chicken meat, and soybeans. Among its main consumer markets are China, the European Union and the United States, despite the restrictions against this advance, such as high tariffs from industrialized countries, phytosanitary barriers, dumping practices, etc. (Jank et al. 2005).

Maranhão and Filho (2017) postulate that there was growth in the participation of agriculture and livestock in total Brazilian exports between 1989 and 2014, a period in which the integration between countries was marked by bilateral and multilateral agreements (free trade zones, customs unions and common markets). In this period, agricultural and livestock products accounted for 30%, on average, of the values exported by the country, an important share for the Brazilian trade balance. A similar fact occurred in the years 1995, 2000 and 2014, where exports contributed to the reduction of the trade deficit, in addition to offsetting the nonagricultural trade deficits in 2001 and 2002 and between 2008 and 2013 (Freitas 2014).

Nevertheless, the inflow of foreign currency, especially the US dollar, resulting from agribusiness exports, has contributed to exchange rate control, serving as an important mechanism of inflationary control (Neves 2017). According to Barros and Castro (2017) given the fact that agribusiness and mineral exports continue to grow strongly, there was a guarantee of financial flow to the country.

The US currency - the dollar - is considered to be one of the variables with the greatest influence on the profitability of exported products. The exchange rate aspect is analyzed *pari passu* to price volatility in the international market (Black 2012; Neves 2012).

Black (2012) maintains that, in addition to the "traditional" motivations of analysis for the growth in the quotation of products in the international market, they can also be listed: increased transport, fertilizers, and energy, in addition to the opportunity cost. Carneiro (2019) adds that the biggest issue that must be taken into account about the price increase is the time factor, since the most intense increases have a short duration.

Other variables must be carefully observed with regard to competitiveness in the international market. Among them are the amount of available natural resources, the training and constant development of available labor, financial resources and financing lines, and the country's infrastructure (Neves 2012). Developments that, according to the author, require support from specific sectoral public policies.

Over the last 120 years, through the development of agricultural economics studies, along with the use of evolving quantitative analytical tools, it has become possible to gauge developments throughout the agribusiness sector. Seeking, among the various aspects involved in production activity, the ability to increase the operational efficiency of supply, processing and distribution in the sector (King et al. 2010).

Stollsteimer (1963), already asserted that this possibility of deepening the analysis of the context in which a crop was inserted, besides, consequently, verifying the real dynamics of the commodities market at the moment, should be widely explored.

Strictly speaking, the competitiveness of agricultural and livestock products in the international market depends directly on the efficiency of the production process, the supply chain and logistics, the marketing aspect, and the macroeconomic factors that influence the sector's support policies (Albuquerque & Filho 2017).

3.4 Commodities

Commodities are products without much differentiation, originating from natural resources (renewable or not) and with low industrial processing. Carneiro (2012) complements by highlighting that they usually come from places specialized in primary activity, since they are traded in large quantities (Sinott 2010). In Pereira's (2009) understanding, as this type of product does not undergo drastic changes by processing, its trading in large scale becomes easier, since any kind of differentiation by batches is minimal.

Commodity can also be a type of commodity, whose scarcity due to reduction of global stocks or exhaustion in extraction can impact the price worldwide (Geman 2005). Another important characteristic of this type of commodity is that they are traded on the world's main stock exchanges, especially because they present significant price volatility, the impossibility of fixing them or even accurately predicting their price, causing an intense search for cost reduction (Neves 2012).

Given that commodities have low differentiation (intrinsic characteristic), efficiency in the management of the entire production chain becomes highly required in order to enhance production capacity (ton. /ha), in addition to other variables external to the property (King et al. 2010).

Although the negotiation in Brazil occurs in the form of 60 kg bags, in the international market products are usually traded in bushels, which have their own weighing for each product. One (1) bushel refers to 27.216 kg, and 25.401 kg, for soy and corn, respectively.

Brazil stands out in the production of important agricultural commodities such as sugar, orange juice, coffee, soybeans, corn, etc. (Mapa 2020). For the purpose of this study, soybeans and corn grain were chosen because they are globally relevant products for both animal and human food, and are among the main commodities exported by the country.

3.4.1 Soybean

In the last two decades, soy and its derivatives (soy meal and oil) have become preponderant in Brazilian agriculture and cattle raising. Besides the fact that a large part of its production is exported (Mapa 2020), it has an important participation in the domestic market, both in animal and human food.

According to Mapa (2020), from the 2013/14 harvest to the 2019/20 harvest, Brazil increased its soybean production by more than 35%, a percentage higher than countries such as the United States and Argentina. Currently, the country is the main producer and exporter of soybeans in the world, ranking third in terms of its derivatives.

Although production is concentrated mainly in the Center-South region of the country, the amount exported only in the first half of 2020 from states in the North and Northeast is already greater than the entire amount of the 2014/15 harvest, demonstrating a significant growth of other regions of the country in the production of the legume (Mapa 2020).

The main causes of the increase in production and demand for soybeans can be attributed to the development and structuring of the international market, the consolidation of soybeans as an important source of vegetable protein, the growing demand of sectors linked to the production of animal origin and the generation of technology, which enable the increasing production (Hirakuri & Lazzarotto 2014).

According to Meade & McBride (2016), Brazil manages to have lower costs in the stages of the soy production process compared to competitor countries, which consequently makes it even more competitive. Soybean pricing is based on several factors, among which we can highlight: quotation on the Chicago Exchange, exchange rate, freight cost, storage cost, and port fees (Dranca et al. 2020).

However, according to Albuquerque and Silva (2016), public policies that support and assist the producer in the country are still necessary, not only in the production aspect itself, but also in all links of the chain, especially the infrastructure needed to ensure the international competitiveness of the product.

3.4.2 Corn

In the mid-1960s, Brazil was a strong importer of food products such as rice, corn, and cereals. Over the years, the country increased its production considerably, reaching the position of third largest producer in the world (Mapa, 2020).

Santos et al. (2020) argue that Brazil, from 1999 to 2009, increased its share in the international corn market-share by more than 500%. As happened with soy, the evolution of corn productivity is mainly due to the development and implementation of new technologies, besides genetic improvement. We highlight the safrinha, and the increase in seed productivity, which became relatively less demanding of inputs (Neves 2012; Maranhão & Filho 2016).

The growth in animal consumption as well as the expectation of increased biofuel production from corn has given the country a vision of potential growth in domestic demand for the product (Neves 2020).

Even with the competition from other producers, such as the United States, India, and Argentina, the country has not ceased to be one of the main exporters of this commodity, occupying the place of second largest exporter of corn, with emphasis on the 2019/20 crop (Mapa 2020).

IV. Result

4.1 Soybean: Planted Area, Productivity and Production

The country has continental dimensions; therefore, it is possible to observe that agribusiness still has production concentrated in specific regions, which increases the dependence of the sector and makes it vulnerable to other factors that have significant influence on production and profitability of farms (example: climatic variations, logistics, among others).

The 2019/20 harvest compared to the previous one (2018/19) showed a considerable increase in productivity and grain production coming from the North and Northeast regions, contradicting the argument of Silva et al. (2020) and Maranhão and Filho (2017) about the difficulty of producing in these regions of the country. It should be noted that the part destined for export was drained mainly through the ports of Belém/Barcarena-PA and São Luís-MA, which presented a larger quantity than Vila-Velha-ES (Mapa 2020). Table 1 systematizes the percentage variation in planted area, productivity and production between the 2018/19 and 2019/20 harvests.

Table 1. Variation in percentage of soybean production and productivity by regions between the 2018/19 and 2019/20 crop seasons.

States	Soybeans (%)		
	Planted Area	Productivity / ha	Production
North	5,9%	6,1%	11,6%
Northeast	0,1%	8,1%	8,3%
Center-West	3,3%	8,3%	11,5%
Southeast	7,2%	13,4%	21,6%
South	1,7%	-11,9%	-10,4%

The drastic reduction in the rates in the South of the country, the second largest grain producer, can be attributed mainly to climate problems, which compromised the production and productivity of all crops (Mapa 2020), especially in the state of Rio Grande do Sul, which showed a 44.9% drop in productivity. Recent facts published in the media have shown incidents of bad weather in the region, which should continue to impact on the variations in productivity, production, and prices of this and other products (Walendorff 2020).

Table 2 systematizes the information on planted area, productivity and production for soybeans in the states of the Southern region of Brazil.

Table 2. Variation of the percentage of planted area, productivity and production in the South region between the 2018/19 and 2019/20 crop

States	Soybean		
	Planted Area	Productivity/ha	Production
Paraná	1,2%	26,3%	27,8%
Santa Catarina	2,4%	-7,7%	-5,4%
Rio Grande do Sul	2,1%	-44,6%	-43,4%

The drop in productivity and production was notably contained by the significant participation of the state of Paraná which, as shown, showed an increase of 26.3% in productivity and 27.8% in production, mitigating the strength of the drop.

As for the production volume of the analyzed harvests, it is evident the 25% increase between the 2015/16 and 2016/17 harvests. In the following harvest, the growth was slightly lower, 6.6%. Although the percentage variation in growth was lower (2016/17 to 2017/18 harvests), the production volume was the highest in the period in the 2017/18 harvest.

Table 3 presents the soybean production data for the 2015/16 to 2019/20 harvests and their respective percentage variations.

Table 3. Production by soybean crop since 2015/16

harvest	Production (mi/ton.)	Variation (%)
015/16	95.400	
016/17	119.300	25%
017/18	127.200	6,6%
018/19	115.030	-
019/20	124.845	10,5%
		8,5%

Even with the 10.5% drop presented between the 2017/18 and 2018/19 harvests, it can be observed that the total amount of production remains about 21% higher than that of the first harvest analyzed (2015/16). The considerable growth of soybean production in recent harvests corroborates to the analyses of Meade and McBride (2016) and Hirakuri and Lazzarotto (2014) on market structuring and competitiveness gain.

The 2019/20 harvest, showed a positive percentage variation of 8.5%, and ranks second in production position among the years analyzed (120,400 million tons), with a difference of about 6% for the record harvest.

The average variability remained positive, at about 6.6% since the first year analyzed, contributing to the maintenance of the country as the largest exporter of the product in the world (Mapa 2020).

4.2 Corn: Planted Area, Productivity and Production

Santos et al. (2016) analyze the country's substantial increase in the global corn market share, a result that can be attributed mainly to the continuous increase in planted area and productivity. But it should also be taken into account the growth of its competitors, such as neighboring Argentina, which almost doubled its production since mid-2012, and the United States, the world's largest grain producer.

Brazilian production must be sustained enough to meet the growing domestic demand, besides being able to allocate an amount that keeps it among the main exporters of the product, as it has been in recent harvests. Otherwise, Brazilian corn may lose preference in the international market, in addition to opening an opportunity for the advancement of other producing nations (Soterroni et al. 2016; Neves 2020).

One of the opportunities for the advancement of grains and agribusiness in general, as postulated by Gasques and Vieira Filho (2016), is the incorporation of new regions in the production process, as occurred with the Midwest. Therefore, attention should be given to the North and Northeast regions, since, in addition to the Midwest, it can be attributed to these regions the sustaining of corn production, which presented respectively 10.8% and 19.8% increment in volume compared to the previous harvest.

Table 4 presents the data on planted area, productivity and production for corn for the period under analysis, separated by regions.

Table 4. Variation in percentage of total corn grain production and productivity by regions between the 2018/19 and 2019/20 crop seasons

States	Corn (%)		
	Planted Area	Productivity /ha	Production
North	8,6%	2,7%	10,8%
Northeast	4,2%	14,5%	19,8%
Center-West	8,5%	-2,9%	5,3%
Southeast	0,9%	-1,3%	1,1%
South	1,1%	-15,3%	-14,4%

It can be seen that; besides the South region, the Midwest and Southeast regions also had a drop in productivity per hectare. The state of Mato Grosso do Sul stands out, with a reduction of 8.5% in productivity and 9.5% in the production of corn grain. The South region remained the main region with a negative harvest.

The state of Paraná was not successful in sustaining the percentage, as it did with soybeans. Table 5 summarizes the information on the percentage variations in planted area, productivity and production for corn in the 2018/19 and 2019/20 crops.

Table 5. Variation of the percentage of productivity and production in the Southern region between the 2018/19 and 2019/20 crop

States	Corn (%)		
	Planted Area	Productivity /ha	Production
Paraná	0%	-10,3%	-10,2%
Santa Catarina	0,3%	-3,6%	-3,3%
Rio Grande do Sul	5%	-35%	-31,8%

Rio Grande do Sul was the state with the greatest difference in productivity and production, even though it had a 5% increase in planted area, it showed a 35% and 31.8% decrease in both aspects. In the other states, Paraná and Santa Catarina, the planted area remained at a similar level to the previous harvest (2019/18), but showed a drop in productivity of 10.3% and 3.6%, respectively. Being the second largest producer of the grain in the country, the region was responsible for the decrease of about 5 thousand tons of the total amount of production, compared to the last harvest (Mapa 2020).

With regard to the total amount of corn production, there was a considerable increase between the 2015/16 and 2016/17 harvests, an increase of about 47%. In the subsequent crop year (2017/18), there was a decrease of 21% compared to the previous one.

Table 6 presents data on the production of corn grain for the last five harvests and their respective variations (%).

Table 6. Production per grain corn crop since 2015/16

Harvest - Corn	Production (mi/ton.)	Variation (%)
2015/16	66.530,6	
2016/17	97.842,8	47%
2017/18	80.709,5	-21,2%
2018/19	100.046,3	23%
2019/20	102.519,0	2,5%

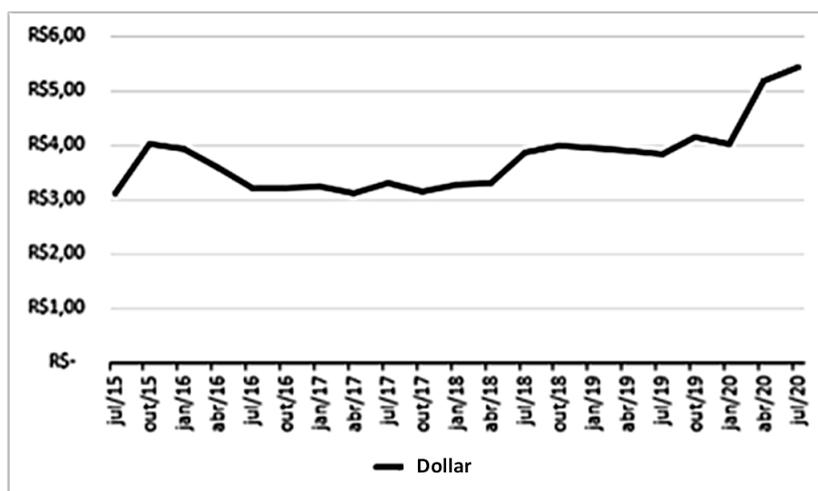
Despite the drop in production in the South region, there was production stability in the 2019/20 and 2018/19 harvests. The harvest presented a significant increase if compared to the four others analyzed, reaching record production. Compared to 2015/16, for example, there was an increase of about 60% in the amount of corn production, and compared to 2017/18, 25%. Additionally, the expectation of grain production foresees an even greater growth in the following harvest (2020/21) (Mapa 2020).

4.3 Pricing: Soybeans and Corn

The agribusiness exports have contributed to the entry of foreign currency in the country. Nevertheless, the increase in production efficiency coupled with technological advances have enabled a substantial increase in the production of fertilizers and inputs, in addition to the optimization of processes, reducing the dependence on imports of these products/services compared to other decades, as pointed out by Barros and Castro (2017). Consequently, the industry became less dependent on the appreciation of the real against the dollar in the production process phase.

The dollar rate evolved from a little over R\$ 3.00 to R\$ 4.00 in the interval of less than a semester in 2015, remaining at a level similar to that at the beginning of the analysis until 2018, when the value of the foreign currency reached again the level of R\$ 4.00 and, since then, has not been quoted again at less than R\$ 3.80. It is also worth noting that the rate reached in 2020 represents more than 75% of that practiced at the beginning of the period of analysis. Figure 1 shows the dollar variation in quarterly periods since July/2015 with data from the Central Bank of Brazil (CBB).

Figure 1. Dollar variation per quarter from Jul/201 to Jul/2020



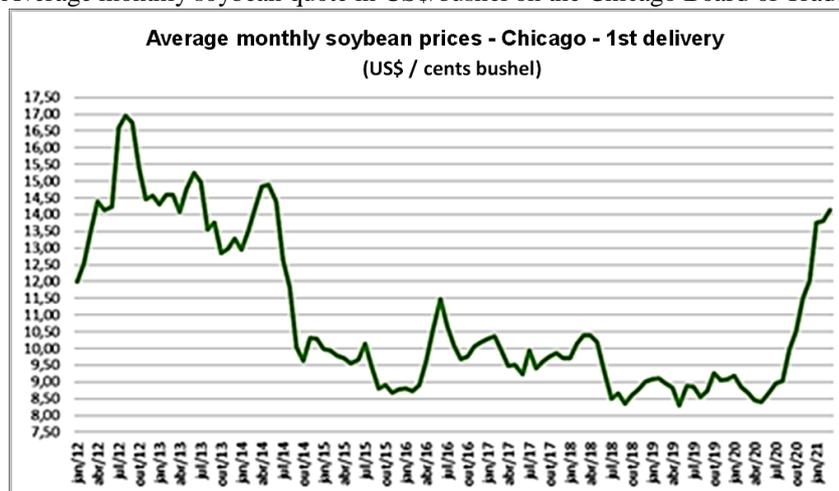
The price level reached by the dollar in 2020 had not been reached since the creation of the Real Plan. The appreciation of the foreign currency against the domestic currency stimulates exports and positively impacts the Brazilian agricultural and livestock revenue, largely destined for foreign markets (Black 2012; Neves 2012). As highlighted by Dranca (2020), one can understand that the pricing of grains is dependent on aspects such as the quotation of the product on the Chicago Exchange, and the dollar.

The world has seen a substantial increase in the demand for agri-food products, especially since the beginning of this century, in the period marked as "commodity boom", with the growth of emerging markets such as India and China (Serigati & Possamai 2016). Given this scenario, Brazil sees opportunities from the increase in demand and the sale price of commodities, increasing its dollar reserves, as well as seeking to consolidate its position as a global agro-exporter, in addition to making efforts to offset deficits in the trade balance from other sectors of the economy, a position that is supported by the studies of Barros and Castro (2017) and Freitas (2014).

Nevertheless, Barros (2016) argues that the boom brought benefits to the country due to other concomitant aspects that made the gains possible, such as the substantial increase in productivity and efficiency that the sector achieved in the period. Otherwise, undesirable situations could be perceived, such as large increases in the price of the basic food basket or shortages.

As of the 2012/13 harvest, soybeans showed a sharp drop in quotations on the Chicago Board of Trade, and sequentially had variations until the 2014/15 harvest, when they showed a drastic reduction. Figure 2 shows the monthly quotations of soybeans on the Chicago Board of Trade since 2012.

Figure 2. Average monthly soybean quote in US\$/bushel on the Chicago Board of Trade since 2012

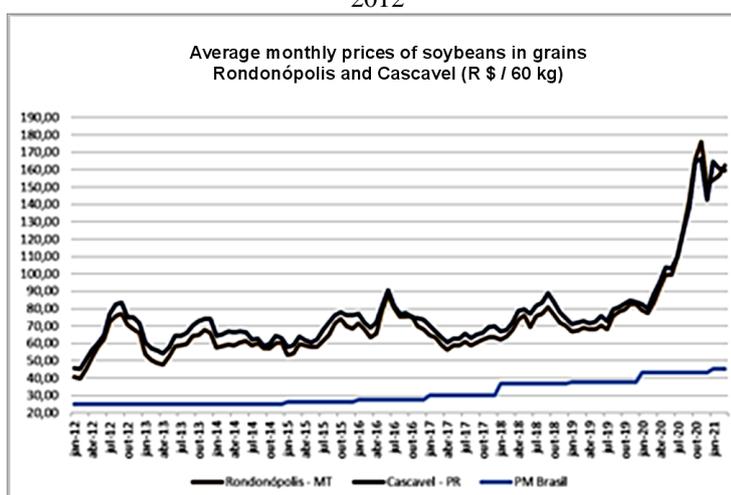


Source: MAPA (2020)

In early 2020, the quotation reached a value lower than 17% of that reached in the same period in the 2018/19 harvest on the Chicago Board of Trade, evidencing the decline in the quotation of the product in this period in relation to past ones. On the other hand, the price of soybeans traded domestically reached a record price, substantially raising the price in several locations around the country, with an increase of 42% compared to the price negotiated in January 2019.

Figure 3 shows the average monthly price of a 60kgs bag of soybeans traded in different locations in the country since 2012.

Figure 3. Average monthly price of a 60kgs bag of soybeans in different locations around the country since 2012

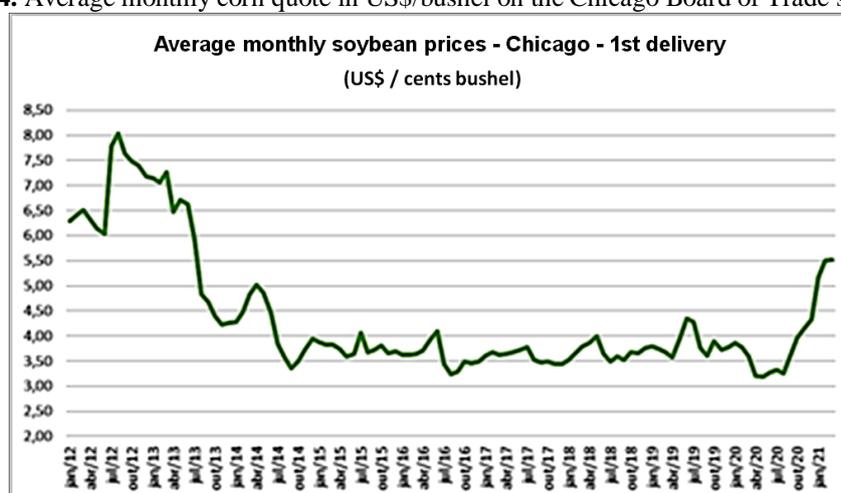


Source: MAPA (2020)

In the 2018/19 crop year, there was an increase of about 55% in the price compared to the previous crop year, a result that can be explained by the increase in the value of the U.S. dollar in the country, in addition to the 10.8% reduction in the total amount of national production of soybeans, as evidenced previously.

Corn had its negotiated price reduced by more than 50% since 2012, a result mainly attributed to the increase in production in countries like Argentina and the United States (Mapa 2020) that have been facing similar variability to soybeans in 2020. Figure 4 presents the average monthly price of corn in bushel on the Chicago Board of Trade since 2012.

Figure 4. Average monthly corn quote in US\$/bushel on the Chicago Board of Trade since 2012



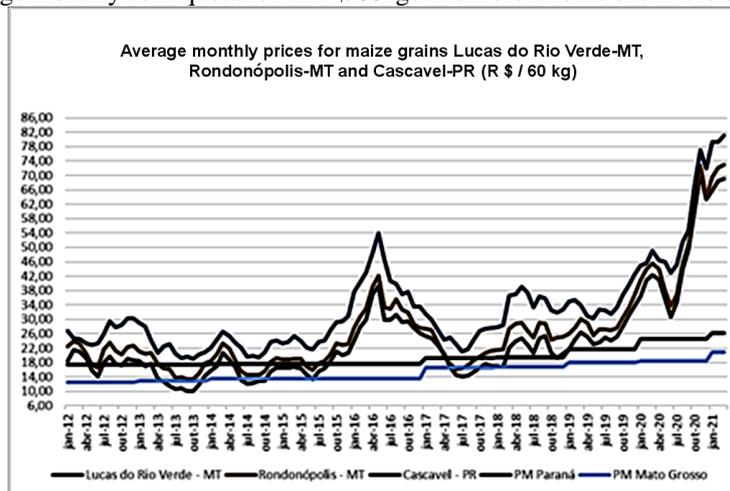
Source: MAPA (2020)

Corn reached in May 2020 its lowest price in the decade negotiated in the Chicago Board of Trade. This fact may have had as one of the causes, the reduction in the volume of ethanol production from corn, especially in the United States. Consequently, there was an increase in the supply of the product in the

international market, contributing to the maintenance of the low price of the commodity, besides suffering the competition, for the planted area, of soybean (Neves 2020), facts that are in line with the studies by Black (2012).

The national average price presented the opposite situation, since it had a strong increase in the same period in several places in the country. The price negotiated in the city of Lucas do Rio Verde - MT, for example, increased by more than 60% between the last quarter of 2019 and the first quarter of 2020, even with an increase in supply of more than 5% in the state. Figure 5 shows the average monthly price of corn grain traded in different locations in the country since 2012.

Figure 5. Average monthly corn quotation in R\$/60kgs in different locations in the country since 2012



Source: MAPA (2020)

After the strong rise, the price became unstable again, showing a drop of more than 10% in the different sites analyzed. As Carneiro (2019) discusses, the crucial issue covering the rise in prices is duration. The historical pattern shows that the most intense positive variations have short periods, as can be observed in the graphic representations. However, the current situation may make the sanitary and phytosanitary control required by importing countries for products such as these even stricter and, consequently, there may be significant changes in the trade flow and global stock, affecting the quotations of agri-food products (Geman 2005).

V. Conclusion

The variability of planted area, productivity and production by region in the 2019/20 harvest was analyzed in relation to past harvests. It was found that there was an increase in the participation of other regions in the calculation of national production, especially the North and Northeast.

On the other hand, in the same period, the South region, the second largest grain producer in the country, faced serious weather problems in the 2019/20 harvest preventing its harvest from reaching the expected level, leading to a reduction of more than 10% in the quantity harvested of the two products surveyed.

As for pricing, the dollar reached a record high since the creation of the Real Plan and favored the profitability of the crop for producers. Also noteworthy is the high prices of the 60kg bag of corn and soybeans internally, which reached double in value in the first quarter of 2020 compared to the same period of 2019. The closing of corn-based ethanol plants in the United States and the consequent change in the supply and price of the product on the international market may change the outlook for grains from the 2019/20 crop onwards.

The limitations of this study are limited, especially with regard to the time frame (five harvests), as well as the number of commodities chosen. However, despite these limitations, they should serve as a stimulus for a future agenda of new research that can advance in the time frame (increase the number of crops analyzed) as well as in the incorporation of other relevant commodities in the Brazilian agro-export scenario.

References

- [1]. Albuquerque ACS, & Silva GA (2008). Agricultura tropical – quatro décadas de inovações tecnológicas, institucionais e políticas. *Embrapa, Informação Tecnológica*, 1337 p.
- [2]. Banco Central do Brasil (BCB). (2020). *Cotação e Boletins*. Retrieved from: <https://www4.bcb.gov.br/pec/taxas/port/ptaxnpsq.asp?frame=1>. Acesso em: 15 jul. 2020.

- [3]. Black C (2012). Eventos relacionados ao superciclo de preços das commodities no século XXI. *Indicadores Economicos Fee40*: 67-78.
- [4]. Barros GSC, & Castro NR (2017). Produto interno bruto do agronegócio e a crise brasileira. *Revista de Economia e Agronegócio* 15: 156-162
- [5]. Barros GSC (2016). Medindo o crescimento do agronegócio: bonança externa e preços relativos. *Agricultura, transformação produtiva e sustentabilidade*. Ipea, 219-250.
- [6]. Carneiro RM (2012). Commodities, choques externos e crescimento: reflexões sobre a América Latina. *Macroeconomía del Desarrollo* 117: 5-47
- [7]. Castro CN (2014). *A agropecuária na região Centro-Oeste: limitações ao desenvolvimento e desafios futuros*. Texto para Discussão: Brasília-DF, Ipea.
- [8]. Cruvinel PE (2009). *Agronegócio e Oportunidades para o Desenvolvimento Sustentável do Brasil*. São Carlos-SP, Embrapa Instrumentação Agropecuária.
- [9]. Companhia Nacional de Abastecimento (CONAB). (2020). *Análise Mensal Abril/Maio - Milho*. Retrieved from: <https://www.conab.gov.br/info-agro/analises-do-mercado-agropecuário-e-extrativista/analises-do-mercado/historico-mensal-de-milho>.
- [10]. Companhia Nacional de Abastecimento (CONAB). (2020). *Análise Mensal Abril - Soja*. Retrieved from: <https://www.conab.gov.br/info-agro/analises-do-mercado-agropecuário-e-extrativista/analises-do-mercado/historico-mensal-de-soja>.
- [11]. Davis JH, & Goldberg RA (1957). *A concept of agribusiness*. Division of Research. Graduate School of Business Administration, Boston: Harvard University.
- [12]. Dranca AC, Neto JCS, & Maciel CDG (2020). Precificação, Originação e Classificação da Soja Realizada por Empresa Exportadora no Brasil. *Avanços Científicos e Tecnológicos nas Ciências Agrárias* 2: 152-71.
- [13]. Ellinger, PN, Hartarska V, & Wilson C (2005). Structure, Performance, and Risk Management of Financial Institutions. *Agricultural Finance Review* 65: 183-200.
- [14]. Freitas RE (2014). Agropecuária e seus Processos na Balança Comercial Brasileira. *Revista de Política Agrícola*, ano XXIII (2): 77-90.
- [15]. Gasques JG, & Vieira Filho JER (Orgs.). (2016). *Agricultura, transformação produtiva e sustentabilidade*. Brasília-DF: Abag/Ipea. 15-21.
- [16]. Geman H (2005). *Commodities and commodity derivatives: modeling and pricing for agriculturals, metals and energy*. Chichester: Wiley, 30p.
- [17]. Hirakuri MH, & Lazzarotto JJ (2014). *O agronegócio da soja nos contextos mundial e brasileiro*. Londrina-PR: Embrapa Soja, 59 p.
- [18]. Jank MS, Nassar AM, & Tachinardi MH (2005). Agronegócio e comércio exterior brasileiro. *Revista USP*, 64: 14-27.
- [19]. King R P, Boehlje, M, Cook M L, & Sonka S T (2010). Agribusiness Economics and Management (April 2010). *American Journal of Agricultural Economics* 92(2): 554-570.
- [20]. Meade B, & McBride WD (2016). Production, transportation, and policy factors determine U.S. export competitiveness in world corn and soybean markets. United States Department of Agriculture (USDA). *The Economics of Food, Farming, Natural Resources, and Rural America* 1(6): 1-7.
- [21]. Ministério da Agricultura, Pecuária e Abastecimento. (2020). *Agropecuária Brasileira em Números*. Brasília. Retrieved from: <https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/todas-publicacoes-de-politica-agricola/agropecuaria-brasileira-em-numeros/abn-06-2020.pdf/view>. Acesso em: 28 jun. 2020.
- [22]. Ministério da Agricultura, Pecuária e Abastecimento. (2020). *Sumário Executivo Milho*. Retrieved from: <https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/todas-publicacoes-de-politica-agricola/sumarios-executivos-de-produtos-agricolas/complexo-milho-pdf/view>. Acesso em: 28 jun. 2020.
- [23]. Ministério da Agricultura, Pecuária e Abastecimento. (2020). *Sumário Executivo Soja*. Retrieved from: <https://www.gov.br/agricultura/pt-br/assuntos/politica-agricola/todas-publicacoes-de-politica-agricola/sumarios-executivos-de-produtos-agricolas/complexo-soja-pdf/view>. Acesso em: 28 jun. 2020.
- [24]. Neves MF (2012). *Doutor Agro*. 5. ed. São Paulo: Editora Gente, 126 p.
- [25]. Neves MF (2020) O Agronegócio nos Tempos de Coronavírus. *Revista Agronomia Brasileira* 4, p. 01-07.
- [26]. Maranhão RLA, & Vieira Filho JER (2017). *Inserção internacional do agronegócio brasileiro*. Texto para Discussão. Brasília: Rio de Janeiro: Ipea.
- [27]. Oliveira EC, & Carraro NC (2019). Análise do Comportamento e Participação do Agronegócio na Composição do Produto Interno Bruto (PIB) Brasileiro: um estudo da série temporal de 1996 a 2017. *Brazilian Journal of Development* 5(11), 24042-24064.
- [28]. Pereira LM (2009). *Modelos de Formação de Preço de Commodities Agrícolas aplicando ao mercado de Açúcar e Alcool*. 209 f. Tese (Doutorado em Administração) – Departamento de Administração, Universidade de São Paulo – FEA-USP. São Paulo, Brazil.
- [29]. Santos LP, Avelar JMB, Shikida PFA, & Carvalho MA (2016). Agronegócio brasileiro no comércio internacional. *Revista de Ciências Agrárias* 39(1), 54-69.
- [30]. Serigati F, & Possamai R (2012). Ciclo de Kondratieff e o Agronegócio Brasileiro: a importância da conjuntura externa para o crescimento do setor entre 2000 e 2015. *Agricultura, Transformação Produtiva e Sustentabilidade*. Brasília-DF: Ipea, 251-278.
- [31]. Silva OR (2020). Fatores Determinantes e Condicionantes para Inovação e Competitividade no Setor do Agronegócio Brasileiro. *Revista Metropolitana de Sustentabilidade* 10, 7-21.
- [32]. Sinnott E, Nashat B, & Latorre, A (2010). Natural Resources in Latin America and the Caribbean. *World Bank* 1, 7-82.
- [33]. Stollsteimer JF (1963). A Working Model for Plant Numbers and Locations. *Journal of Farm Economics* 45: 631-645.
- [34]. Walendorff R (2020). *Ciclone causa prejuízos milionários na agricultura*. Valor Econômico. Retrieved from: <https://valor.globo.com/brasil/noticia/2020/07/04/ciclone-causa-prejuizos-milionario-na-agricultura.ghtml>.
- [35]. Waugh FV (1934). Margins in Marketing. *Journal of Farm Economics* 16: 233-245.

João Pedro Morasco Agostinho, et. al. “Brazilian Soybean and Corn Panorama: Production and Price Study for the 2019/2020 Crop.” *IOSR Journal of Business and Management (IOSR-JBM)*, 23(04), 2021, pp. 40-50.